

**Cosmological argument:** derived from the Greek terms *cosmos* (world or universe) and *logos* (reason or rational account). The cosmological argument, first developed by the ancient Greek philosophers, takes a variety of forms. The common theme among them all is that since there is a cosmos which exists, rather than just nothing, it must have been caused by something beyond it.

For at least two millennia philosophers have attempted to demonstrate, through reason and argument, that God exists. Of course not all theists agree that God's existence can be demonstrated through argument, and some even agree with the atheistic thesis that no rational account of God's existence can be offered. Some theists, however, have gone so far as to maintain that there are rational means for *proving* that God exists, while others assert that God's existence can be plausibly demonstrated but not proven.

Many arguments have been constructed to prove, or at least provide reason for, belief in God, and in this and the next two chapters we will be examining three of them. In this chapter we will work through various forms of the cosmological argument.<sup>1</sup> The different versions of the cosmological argument each begin by focusing on some empirical fact of the universe from which it then follows that something outside the universe must have caused it to exist. Suppose, to use one example from countless possibilities, that on some future manned exploration to a distant planet, the astronauts discovered six spherical objects perfectly resting on top of one another. Surely, these discoverers would conclude, these objects and their hierarchical structure must have come from something, and from somewhere. But they could also ask about that something: "What was the cause of that thing's existence which caused these objects to exist?" And so on. But can this series of causes for things continue on indefinitely? Intuitively, it seems that it must stop somewhere – there must be some originating cause. So, too, argue defenders of the cosmological argument, when we begin examining the causes of (or reasons for) the things which exist in the universe, and of which the universe consists, the causal chain must stop somewhere. For theists, this cause is God.

In what follows we'll first consider three cosmological arguments for God's existence as well as various objections to them.<sup>2</sup> We will then explore a kind of cosmological argument which concludes that God does not exist.

## THE ARGUMENT FROM CONTINGENCY

The person who has probably received the most recognition for offering a cosmological argument for God's existence is the Catholic monk, St. Thomas Aquinas

**St. Thomas Aquinas** (1224–1274) was an outstanding theologian, philosopher, and Christian apologist of the medieval Roman Catholic Church. He wrote many books on a wide variety of topics, including faith and reason, revelation, epistemology, ontology, ethics, and government. His style of writing is complex and terse, and often follows the style of the medieval dialectic. His most influential work is his magnum opus – the *Summa Theologiae* – a massive systematic theology. St. Thomas was canonized by the Catholic Church in 1326.

(1224–1274). In his work the *Summa Theologiae*, Aquinas offers five concise arguments for God's existence, four of which are cosmological in nature. Aquinas didn't invent cosmological arguments; they go back at least as far as the ancient Greek philosophers Plato<sup>3</sup> (c. 428–c. 348 BCE) and Aristotle<sup>4</sup> (384–322 BCE) and are more fully articulated by medieval Jewish, Christian, and Islamic thinkers. Nowhere, however, are they as clearly and concisely put as in Aquinas' *Summa* – all four of them are contained in less than two pages.<sup>5</sup> The most famous of Aquinas' cosmological arguments is his "third way." Also known as the argument from contingency, or the Thomistic cosmological argument (derived from his name, *Thomas Aquinas*), he spells it out as follows:

The third way is taken from possibility and necessity, and runs thus. We find in nature things that are possible to be and not to be, since they are found to be generated, and to corrupt, and consequently, they are possible to be and not to be. But it is impossible for these always to exist, for that which is possible not to be at some time is not. Therefore, if everything is possible not to be, then at one time there could have been nothing in existence. Now if this were true, even now there would be nothing in existence, because that which does not exist only begins to exist by something already existing. Therefore, if at one time nothing was in existence, it would have been impossible for anything to have begun to exist; and thus even now nothing would be in existence – which is absurd. Therefore, not all beings are merely possible, but there must exist something the existence of which is necessary. But every necessary thing either has its necessity caused by another, or not. Now it is impossible to go on to infinity in necessary things which have their necessity caused by another, as has been already proved in regard to efficient causes. Therefore we cannot but postulate the existence of some being having of itself its own necessity, and not receiving it from another, but rather causing in others their necessity. This all men speak of as God.<sup>6</sup>

The central feature of this cosmological argument is outlined in the 'Argument from contingency' box overleaf.<sup>7</sup>

## THE ARGUMENT FROM CONTINGENCY

- 1 There are contingent things in the world; that is, there are things (or beings) in the world which:
  - begin to exist at some point,
  - are caused to exist by some other thing,
  - could cease to exist at some point, and
  - could have never existed at all.
- 2 But not all things can be contingent things, for in that case nothing would now exist since what begins to exist does so through what already exists (i.e. nothing cannot cause something to exist).
- 3 Since contingent things do exist, there must be some non-contingent, or necessary, thing. That is, there must be some thing (or being) which:
  - did not begin to exist at some point,
  - is not caused to exist by some other thing,
  - will not cease to exist at some point, and
  - could not have not existed,
  - which caused the contingent things to exist.
- 4 We call this necessary thing (or being) God.

Since the argument is valid, meaning that if the premises are true the conclusion must follow, the question before us is whether or not the premises are true.<sup>8</sup>

Premise 1 is widely held: there are contingent things in the world. For example, consider my friend's cat, Jack (named after C. S. "Jack" Lewis). Jack the cat began to exist, was caused to exist by some other thing (primarily his parents), will eventually cease to exist, and could have never existed (suppose his parents never met). So, there are contingent things, or beings, in the world. Premise 1, then, seems reasonable to believe. However, the next step in the argument – premise 2 – is not so intuitively plausible.

Is it the case that not all things can be contingent things? Aquinas argues that if all things are contingent, then nothing could have ever come to exist since there would have been no originating causal agency by which to cause anything to exist. There are various ways to support this point. First, it might be argued that nothing could ever have come into existence because in that case a contingent series would need to be an actual infinite series, but an actual infinite series is impossible (the notion of an actual infinite series will be discussed below in the kalam argument section).<sup>9</sup> Aquinas himself didn't hold to this view, however, so we'll ignore it here.

Second, regardless of whether or not an actual infinite causal series is possible, it is argued that since contingent things are things which might not exist, then they are not necessary things (or necessary beings); their existence is a *possible* existence,

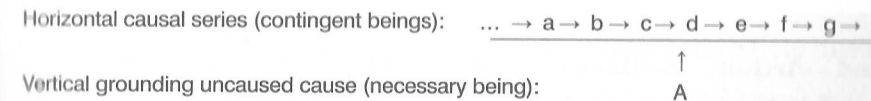


Figure 4.1 The need for an outside uncaused cause

not a *necessary* existence – it depends on another. But not all existence can be possible existence, for what is merely possible does not account for what is actual. For example, if *g* was caused by *f*, and *f* was caused by *e*, and *e* was caused by *d*, and so on, it seems that the series is inexplicable by itself, no matter how far back we go. If all the things in the series are contingent (i.e. things dependent on other things), that is to say, it seems that the sum total of the series is also contingent. Since every thing in the series of contingent things needs a cause for its existence, how can the series taken as a whole not also need a cause?

In a famous twentieth century debate between well-known atheist philosopher Bertrand Russell (1872–1970) and Catholic philosopher Father Frederick Copleston (1907–1994), the latter summarizes the point concisely:

If you add up chocolates you get chocolates after all and not a sheep. If you add up chocolates to infinity, you presumably get an infinite number of chocolates. So if you add up contingent beings to infinity, you still get contingent beings, not a necessary being. An infinite series of contingent beings will be, to my way of thinking, as unable to cause itself as one contingent being.”<sup>10</sup>

So, as spelled out in premise 3, it seems that an outside cause – one that is itself uncaused and grounds the contingent series – is needed for the series (see Figure 4.1). As we'll see in the next section, this argument for premise 2 is very similar to the sufficient reason argument.

Furthermore, defenders of the argument from contingency may argue, this uncaused ground of the contingent series is what is meant by *God*. Therefore, God must exist.

Of course, not everyone agrees with this conclusion. In order to deny the conclusion, though, one must deny one or more of the premises. The following are some of the various objections, then, to this form of the cosmological argument.

### Objection 1: the contingent series just is

A first response is to claim that the causal series doesn't need an explanation; it just is. This was one basic response offered by Bertrand Russell in the debate noted above. He argued that we derive our understanding of a cause from our observations of what happens in the world. But why go beyond this? There is no reason, he maintains, to go beyond our experience and suppose that the whole series needs an

**Bertrand Arthur William Russell** (1872–1970) was a British mathematician, logician, philosopher, and social reformer. He became a Fellow of Trinity College, Cambridge, and then later in his career Lecturer in Philosophy. In 1916 he was dismissed of his position at the university due to his agnosticism and pacifism. He was later reinstated but refused the offer. He wrote a number of important books, including *Principia Mathematica* (co-authored with A. N. Whitehead) and the popular *The Problems of Philosophy*. In 1949 he received the Nobel Prize for Literature.

explanation. As he puts it: “I see no reason whatsoever to suppose that the total has any cause whatsoever...I should say that the universe is just there, and that’s all.”<sup>11</sup>

How would a defender of the cosmological argument respond to this objection? One way would be to claim that since each part of the series needs a cause then the series as a whole must also need cause, for the series is nothing more than the summation of its parts. However, this leads to the next objection.

### Objection 2: the fallacy of composition

As the debate continued, Russell then accused Copleston of committing a logical fallacy – the fallacy of composition. Here’s how the objection goes: just because the parts of a whole have a particular attribute (such as being contingent), it doesn’t follow that the whole also has that attribute. Various examples can be cited to demonstrate the point. For example, even though all of the stones that make up a medieval castle wall are small, it doesn’t follow that the medieval castle wall is also small. So too with the universe, argue objectors; just because the parts that make it up are each contingent, and thus in need of a causal explanation, it does not follow that the whole is contingent, and thus in need of a causal explanation.

Defenders of the cosmological argument respond by arguing that this castle analogy is faulty. A more accurate analogy, they maintain, is this: since the medieval castle wall is made of stones, it is a *stone* castle wall. That is to say, since all of the parts that make up this castle wall are stones, the wall as a whole is stone. So too with the universe; since each of the parts that make it up are contingent, the whole must be contingent as well. Objectors disagree, and the debate then centers around which kind of analogy better reflects the universe and its constituent parts.

### Objection 3: explaining the parts of a whole explains the whole itself

An objection related to the previous one is that if the individual parts that make up a thing are all explained, then the whole itself is explained as well. Scottish historian and philosopher David Hume (1711–1776) wrote a masterpiece in philosophy of religion entitled *Dialogues Concerning Natural Religion*. In making this sort of objection, Hume states the following:

But the *whole*, you say, wants a cause. I answer that the uniting of these parts into a whole, like the uniting of several distinct countries into one kingdom, or several distinct members into one body, is performed merely by an arbitrary act of the mind, and has no influence on the nature of things. Did I show you the particular causes of each individual in a collection of twenty particles of matter, I should think it very unreasonable should you afterwards ask me what was the cause of the whole twenty. This is sufficiently explained in explaining the parts.<sup>12</sup>

Hume is certainly right that sometimes it is the case that an explanation of the parts of a thing explains the whole of which the parts consist, at least at one level. To use his own example referring to a particular kingdom, an explanation for “Why is this a kingdom?” can be “Because several countries united.” But, of course, at another level this answer is incomplete. One could also reasonably seek the cause for why the countries were, in fact, united together to make the kingdom, for kingdoms are the types of things which involve the uniting of countries for specific reasons. So this analogy, as well as the one he uses about the members of a body, do not appear to work in the way Hume had supposed.

In order to affirm that the universe as a whole doesn’t need a cause, it seems that one would have to affirm that the contingent individuals of which the series consists also do not need causes. But this is simply to affirm that they are not contingent after all.<sup>13</sup>

### Objection 4: who caused God to exist?

One might object that if the universe as a whole needs an explanation because the contingent series of which it consists needs an explanation, then so too God needs an explanation. To paraphrase a common colloquialism, what’s sauce for the contingent goose is also sauce for the necessary gander. On the other hand, if God does not need a cause, then the contingent series that makes up the universe does not need a cause either.

In response, defenders of the argument agree that the causal series must stop somewhere – there must be a grounding explanation. However, by definition contingent things need causes, whereas necessary things do not. So, by definition

God (as a non-contingent, necessary being), does not need a cause. By definition, that is to say, God is the uncaused cause who explains the contingent series that makes up the universe. Whether God actually exists or not is a separate issue from this response to the objection; it is only affirming a commonly held definition of God, and then noting that such a definition does indeed provide a grounding explanation for the otherwise unexplained series.

#### **Objection 5: even granting the existence of a necessary cause, this cause need not be God**

There are a number of different aspects of this objection, but the essence of it is that even if we grant premises 1–3, there is no reason to believe that this necessary being is God – certainly not the God of the theistic religions. This is a serious objection to this form of the cosmological argument. Why should one infer that the necessary being is equivalent to God? Perhaps the necessary being is more akin to Aristotle's God, a "most moved mover" of pure, impersonal thought. Such a view of God is far removed from the personal, engaging being proffered by the major theistic religions.

One response to this objection is to maintain that the necessary being entailed by the cosmological argument is best understood as the most perfect being of the ontological argument.<sup>14</sup> We'll examine the ontological argument in Chapter 6 but a difficulty here, as noted by Immanuel Kant (1704–1824), is that if the concept of a necessary being is expressed in terms of the concept of a most perfect being (and the latter is central to the ontological argument), this seems to make the cosmological argument dependent on the ontological argument, and many have argued that the ontological argument is defective.

Another response to this objection is simply to grant it and admit that this cosmological argument, taken by itself, does not entail the God of the traditional religions. Responders of this ilk typically maintain that it does provide reason to believe in *some* kind of a God, and thus provides reason not to be an atheist.

## **THE SUFFICIENT REASON ARGUMENT**

A second form of cosmological argument is called the sufficient reason argument, or the cosmological argument from sufficient reason. It is similar to the argument from contingency but it is based on the premise that there must be a sufficient reason, or explanation (rather than a cause), for the existence of any contingent being as well for the contingent universe as a whole. The earliest proponents of the sufficient reason argument were the German rationalist philosopher Gottfried Wilhelm Leibniz (1646–1716) and the English philosopher Samuel Clarke (1675–1729).<sup>15</sup> The 'Sufficient reason argument' box shows one way of stating the argument.

## **THE SUFFICIENT REASON ARGUMENT**

- 1 All things (beings) which exist must have a sufficient reason for their existence.
- 2 The sufficient reason for the existence of a thing must either lie in the thing itself or outside the thing.
- 3 All things in the universe are things the sufficient reason of which lie outside themselves (i.e. nothing in the universe provides its own explanation for its existence).
- 4 The universe is nothing more than the collection of the things of which it consists.
- 5 Thus, there must be a sufficient reason for the universe as a whole which lies outside itself.
- 6 There cannot be an infinite regress of such sufficient reasons, for then there would be no final explanation of things.
- 7 Therefore, there must be a first self-explanatory thing (Being) whose sufficient reason for its existence lies in itself rather than outside itself (i.e. a Necessary Being whose non-existence is impossible).

Simply put, the essence of this argument is that everything which exists in the world needs an explanation for its existence, and nothing in the world provides an explanation for itself (including the world as a whole). So, there must be an explanation outside of it – an explanation that is sufficient unto itself. And we call such an explanation "God."

A related question posed by Leibniz is this: "Why is there something rather than nothing?" Why does the universe exist rather than just nothing? Doesn't it seem reasonable to seek an explanation for its existence? An analogy might be helpful at this point. Philosopher Richard Taylor (1919–2003) asks us to imagine that we are walking through a forest and come across a translucent ball:

Suppose, then, that you have found this translucent ball and are mystified by it. Now whatever else you might wonder about it, there is one thing you would hardly question; namely, that it did not appear there all by itself, that it owes its existence to something. You might not have the remotest idea whence and how it came to be there, but you would hardly doubt that there was an explanation. The idea that it might have come from nothing at all, that it might exist without there being any explanation of its existence, is one that few people would consider worthy of entertaining.

He continues,

This illustrates a metaphysical belief that seems to be almost a part of reason itself, even though few ever think upon it; the belief, namely, that there is some explanation for the existence of anything whatever, some reason why it should exist rather than not. The sheer nonexistence of anything, which is not to be confused with the passing out of existence of something, never requires a reason; but existence does. That there should never have been any such ball in the forest does not require any explanation or reason, but that there should ever be such a ball does.<sup>16</sup>

Whether referring to some concrete particular thing, such as a baseball bat or the translucent ball noted above or to the universe as a whole, given their existence, it seems reasonable to ask for an explanation for their being. The defender of the argument from sufficient reason, then, puts the detractor on the defensive and asks this question: "Who is being more reasonable, the person who maintains that there is a sufficient reason for the existence of the universe, or the one who denies it?" At first glance, the answer seems obvious.

In response, there have been a number of objections raised against the sufficient reason argument. Several of the objections noted above regarding the argument from contingency, for example, can also be applied to this argument. We won't rehearse those objections here, but other ones have been raised specifically against the argument from sufficient reason.

### **Objection 1: there is no way to demonstrate that the principle of sufficient reason is true**

According to this objection, there is no way to prove Leibniz's principle of sufficient reason (that every fact and true statement has a sufficient reason for why it is the way it is and not otherwise). First, there is no empirical evidence to prove the principle – we cannot infer from our sensory experience that every fact and true statement has a sufficient reason for the way it is. Second, it is not a logically necessary truth – its truth can be logically denied. Third, it is not an a priori truth; while a number of philosophers have believed it to be true, others have denied that it is. Since premise 1 of the argument is based on this principle, this objection raises serious doubts about the sufficient reason argument.

One way of responding to this objection is to maintain that the principle of sufficient reason is more reasonable to believe than to deny. One could, for example, argue that it is a properly basic belief (like my believing that I exist, or my believing that there is really an external world) or that one can simply intuit its truth. It does seem that many, if not most, people do believe that there is some reason why things exist rather

**Properly basic belief.** A properly basic belief is a belief for which it is possible but foolish to require justification. Examples include the beliefs that I exist, that there are other minds, and that there is an external world.

than not. It could also be noted that the very practice of science presupposes that this principle is true. Imagine a scenario in which a scientist, intending to find the reason why twenty experimental mice in her lab developed large tumors, concluded that there was no reason at all for the growths! It's doubtful that the scientist would be taken seriously.

Of course these responses presuppose that the principle itself is coherent, but as we'll see next, some have argued that it is not.

### **Objection 2: the principle of sufficient reason is incoherent**

According to this objection, the principle of sufficient reason turns out to be an incoherent notion with respect to the existence of the universe. Here's how the objection goes. Either the explanation for the existence of the contingent universe is itself in need of further explanation, or it isn't. If it is in need of further explanation, then it too is contingent, and so it doesn't provide an ultimate explanation (i.e. it isn't a sufficient reason) for universe. On the other hand, if the explanation for the existence of the contingent universe is itself a necessary one, then what it explains (i.e. the universe) must also be necessary. The universe would have to be necessary, rather than contingent, since that which is explained by a sufficient reason is also entailed by it. So if the universe is entailed by a necessary being, then it must also be necessary. If the universe is necessary, then it doesn't need an external explanation for its existence.

In response, defenders of the sufficient reason argument grant that the explanation for the existence of the contingent universe must itself be either contingent or necessary, and they conclude that it must be necessary. However, they disagree with the point that since the explanation of the universe is a necessary being, the universe must itself be necessary. The reason that it wouldn't have to be necessary, they argue, is that if the necessary being – i.e. God – has free will, then God could have chosen not to create the world. So it is contingent, not necessary.

However, if God need not have created the world, then citing his existence does not provide a sufficient reason for the world's existence. There needs to be a reason why he chose to make the world. If this is a sufficient reason, then God could not but have created the world and his choice was not free (in an indeterministic sense). If it is a contingent fact that God chose to create this world, the principle of sufficient reason will not be satisfied, because it demands that all contingent facts have a sufficient explanation.

Furthermore, reply objectors, if God is the most perfect being (as traditional theists maintain), and if a perfect being would not create an inferior universe (as traditional theists also maintain), then God had to create this world – the best of all possible worlds. Therefore it is necessary, not contingent.<sup>17</sup> And so the debate goes.

### Objection 3: the subjectivity of an explanation

Another objection is that even assuming that every thing has a sufficient explanation, what constitutes a satisfactory explanation for one person may not be so for another. In this regard one's worldview may come into play. A satisfactory explanation for an atheist for a given phenomenon may be quite different from that of a theist, or a pantheist, or a panentheist.

### Objection 4: science has demonstrated that there need not be reasons or explanations for all things and events

Many contemporary physicists and philosophers of science hold to an indeterministic interpretation of quantum mechanics in which certain quantum events happen without any prior cause or reason whatsoever. So why should one maintain that the universe itself needs a reason or explanation? Perhaps it has simply always existed, or perhaps it popped into existence for no reason at all.

Not everyone agrees with this interpretation of quantum mechanics, though, and some have argued that the issue here is epistemological, not ontological. In other words, just because we don't *know* why a certain quantum event occurred, it doesn't follow that there was *no reason* for that event. Albert Einstein (1879–1955), who was awarded the Nobel prize for his contribution to quantum theory, for example, never agreed with this interpretation. As he put it, "God does not play dice" with the universe. However, his colleague Niels Bohr (1885–1962) – co-founder of the (indeterministic) Copenhagen interpretation of quantum mechanics – had this to say in response: "Einstein, don't tell God what to do." Currently, each side of this scientific dispute accuses the other of having the burden of proof. Hopefully, further scientific advances will provide better answers to this conundrum.

## THE KALAM ARGUMENT

A third form of cosmological argument is referred to as the kalam argument – the term "kalam" being an Arabic word meaning "speculative theology." It was developed in medieval times by two Islamic philosophers, al-Kindi (c. 801–c. 873) and al-Ghazali (1058–1111). Its leading defender in recent times is Christian philosopher William

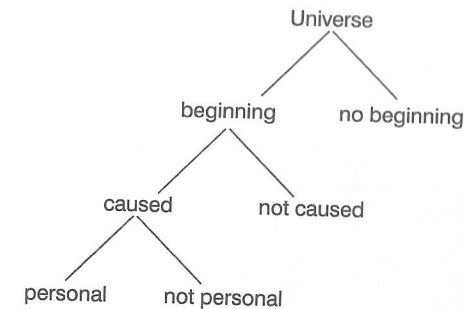


Figure 4.2 The dilemmas of the kalam argument

Lane Craig (1949–), and in explaining and defending the argument he first sets up the structure shown in Figure 4.2.<sup>18</sup>

The dilemmas are obvious. Either the universe had a beginning or it didn't. If it did, either that beginning was caused or it was not caused. If it was caused, either the cause was personal or it was impersonal. Based on these dilemmas, the argument can be put in the logical form shown in the 'kalam argument' box.

As stated, the argument is logically valid. So, once again, the important question is, are the premises true? The first premise seems intuitively obvious. If something comes into being, there must be something which caused it to come into being. Historically, this step was not often denied, even by those who doubted or denied God's existence, for the simple reason that physical events seem to be traceable back to prior causes (in theory, if not in actual practice). But while its truth may be intuitive, as noted in the previous section there have emerged in recent times significant objections to it.<sup>19</sup>

A different kind of objection to this first premise is that if everything that exists needs a cause, doesn't God also need a cause? This objection was also discussed earlier. But note that the claim in this argument is NOT that whatever *exists* needs a cause. Rather, it is that whatever *begins to exist* needs a cause.

## THE KALAM ARGUMENT

- 1 Whatever begins to exist has a cause of its existence.
- 2 The universe began to exist.
- 3 Therefore, the universe has some kind of cause of its existence.
- 4 The cause of the universe is either an impersonal cause or a personal God.
- 5 The cause of the universe is not impersonal.
- 6 Therefore, the cause of the universe is a personal God.

**al-Ghazali** (1058–1111) was an outstanding theologian, philosopher, and mystic of medieval Islam. He has been celebrated as the “Proof of Islam” and the “Renewer of Religion.” His most famous work is the *Incoherence of the Philosophers* in which he attacks an Aristotelian version of Arabic philosophy. In this work he argues that reason alone is unable to provide a complete proof for a theistic worldview. But he does provide an argument that the universe had a beginning in time – a *kalam* argument – for he holds that believing in an eternal universe is equivalent to believing in atheism.

On the standard Christian, Jewish, Islamic, and theistic Hindu accounts, God did not *begin* to exist. God has always existed; God is the uncaused cause. So to ask who caused the uncaused cause is to ask an incoherent question. Of course one could object to this meaning of God, but the objector might at least grant that such a meaning is a coherent one; whether it is true or false is a different question.

Other criticisms of the first premise have been offered, but the step in the argument which has been most challenged by the antagonist of the kalam argument is not premise 1, however, but premise 2. Craig and others have maintained that there are philosophical arguments and scientific evidences that strongly support the claim that the universe began to exist. So we will next examine evidences for this claim as well as responses to them.

### A philosophical argument for the beginning of the universe

There are two main philosophical arguments for the premise that the universe had a beginning. We only have space for one of them – the one a number of philosophers consider to be the most plausible – which we will call the “Crossing the infinite argument.” It can be expressed in three steps.<sup>20</sup>

Since the series cannot be an actual infinite, it must be finite. Being finite, the series of events in time must have a beginning. So the universe must have a beginning.

Let’s examine each of the steps of this argument. First, *prima facie* step 1 seems to be fairly clear-cut. The events that make up all of history are taken one after the other. They did not all happen at once, but were sequentially occurring as time moved forward. Just as the events that occurred in your life from 8:00 a.m. this morning to 8:00 p.m. this evening are a collection of events formed by successive addition (they are one added after another), so too are all the events in your life and, indeed, all of the events in history. This view of time is not universally accepted, though, and one objection to this premise is that it entails a faulty notion of the nature of time.<sup>21</sup>

### CROSSING THE INFINITE ARGUMENT (SUPPORTING PREMISE 2 OF THE KALAM ARGUMENT)

- 1 The series of events in time that makes up the whole history of the universe is a collection formed by adding one member after another.
- 2 A collection formed by adding one member after another cannot be an actual infinite.
- 3 Therefore, the series of events in time that makes up the whole history of the universe cannot be an actual infinite.

Premise 2 is the one more generally criticized by objectors. Before examining it, however, the phrase “actual infinite” needs to be briefly explained. By definition, an actual infinite is a *completed* totality or set of things or events rather than an *indefinite* one. In order to get clear on this, it’s helpful to contrast an actual infinite with a potential infinite. A potential infinite is an incomplete set in that it continues on indefinitely but never reaches the point of being an actual infinite. For example, you could begin counting now and continue on forever. But you would never get to the place where you could stop and say “I’ve finally finished counting an actual infinite set of numbers.”

A potential infinite, then, is indefinite in that it gains new members as it expands but never reaches an end. An actual infinite, on the other hand, is definite – it is a complete set; it has a fixed number of members in it.<sup>22</sup> The point here is that since you could never reach an actual infinite by moving one member after another (that is, by successive addition), but yet here we are at the end of the set of events that makes up history to this point, the set of events that makes up the past cannot be actually infinite. So, the set of events that makes up the past must be finite, and thus the universe must have a beginning.

### Objection: the temporal series has no beginning

Several objections have been offered to this crossing the infinite argument, and one of them is given by Nicholas Everitt. Perhaps, he suggests, there is *no* starting point at all to the temporal series; perhaps the series does not have an earliest member. No vicious regress emerges from such an assertion, he argues, for just as the future can go on forever, so too the past could go back forever. It’s only in assuming a *beginning* to an infinite series that creates the objectionable problem.<sup>23</sup>

However, the following reply can be made. If there were a *beginningless* series, it would be absurd to suppose that we could have ever reached the present moment,

The problem here is neither a matter of not having enough time nor of infinitely adding one member after another. Rather, it seems to be a metaphysical absurdity. Craig puts it this way:

Indeed, the idea of a beginningless series ending in the present seems to be absurd. To give just one illustration: suppose we meet a man who claims to have been counting from eternity and is now finishing: ..., -3, -2, -1, 0. We could ask, why did he not finish counting yesterday or the day before or the year before? By then an infinite time had already elapsed, so that he should already have finished by then. Thus, at no point in the infinite past could we ever find the man finishing his countdown, for by that point he should already be done! In fact, no matter how far back into the past we go, we can never find the man counting at all, for at any point we reach he will have already finished. But if at no point in the past do we find him counting, this contradicts the hypothesis that he has been counting from eternity. This illustrates the fact that the formation of an actual infinite by successive addition is equally impossible whether one proceeds to or from eternity.<sup>24</sup>

Objectors could respond by arguing that the notion of a beginningless series may seem absurd, but fact is often stranger than fiction. It seems absurd to suppose that the physical object before me, a computer keyboard, is actually mostly empty space with countless micro-particles swirling at very high rates of speed. But according to our best physical theories, that is precisely what it is.<sup>25</sup>

## Two alleged scientific evidences for the beginning of the universe

### *Evidence 1: the second law of thermodynamics*

One of the most established laws of science today is the second law of thermodynamics. Fundamental to the second law is entropy, which is understood to be the measure of unavailable energy, or disorder, in a closed system. An example of entropy would be the measure of the decrease of heat energy in a glowing ember. As the ember cools, the energy in the wood dissipates as the heat disperses into the surrounding environment. According to the second law, the amount of available energy in a closed thermodynamic system – a system within which no new mass or energy is placed – decreases over time. If the universe is such a closed thermodynamic system, the entropy in the universe is increasing over time. To put it differently, the amount of available energy and order in the universe is *decreasing* over time. As such, it will eventually reach a state of thermodynamic equilibrium (in this case, such equilibrium would mean that the temperature would remain constant). All of the hot stars in the universe, for example, will eventually cool off

and remain stable at a constant temperature – no longer expending heat energy. The universe will eventually reach a state of thermodynamic equilibrium and maximum disorder, what some refer to as the “heat death.”<sup>26</sup> The question, then, raised by kalam proponents, is this: “Why has the universe not already reached this state of thermodynamic equilibrium?”

Consider the following analogy. Suppose that you walk into a room and see a cup of Starbucks™ coffee (my favorite brew) placed on the table before you. You wonder how long it has been sitting there and so, while no one is watching, you take a sip. You discover that it is still warm. Would you then conclude that the cup of coffee had been sitting there for months, weeks, or even days? Of course not. Why not? Because of the second law of thermodynamics and entropy; the heat energy in the coffee has not fully dissipated, and so it could not have been sitting there for very long. Since the universe is still “hot” (note the hot star in our own solar system, for example – the sun), argue defenders of the kalam argument, it could not have existed forever or it too would have “cooled off” long ago. Therefore, the universe could not have existed forever; it must have a beginning. Not everyone agrees with this conclusion, of course.

### OBJECTION 1: THE OSCILLATING UNIVERSE THEORY ESCAPES THE GRIP OF THE SECOND LAW AND ELIMINATES THE NEED FOR A BEGINNING OF THE UNIVERSE

Some physicists have argued that the universe could escape the heat death by hypothesizing a cycle of expansion and contraction of the universe, referred to as the “oscillating universe theory.”<sup>27</sup> On this model, after an expansion of the universe, gravity eventually stops it, causes a contraction, and it collapses back into a singularity. After the contraction and collapse, some mechanism causes the universe to explode into a new universe and then to begin the expansion process once again. Since this cycle can continue on indefinitely, there is no need to posit a final heat death, and thus no need to posit a final end or beginning to the universe. The empirical evidence over the past fifty years has strongly favored the standard big bang model, however, and not the oscillating one. The evidence for the big bang has been so strong, in fact, that virtually no one holds to the oscillating model today.<sup>28</sup>

### OBJECTION 2: THE UNIVERSE IS INFINITE, AND THUS THE SECOND LAW OF THERMODYNAMICS DOESN'T APPLY TO THE UNIVERSE AS A WHOLE

According to this objection, the universe is infinite and thus not a closed thermodynamic system. Since it's not such a system, the second law doesn't apply to the universe itself. There currently exists debate among cosmologists about whether the universe is infinite or finite in spatial extent and volume. However, according to



big bang cosmology, the observable universe (the region of space that any hypothetical observer can view, and which is scientifically relevant) is certainly finite.

### Evidence 2: the big bang theory

A second kind of scientific evidence, then, offered for the beginning of the universe is the big bang theory. For many centuries astronomers and scientists generally agreed that the universe was static – that it was stationary and not expanding in any significant sense. However, in the early 1900s, a number of very important scientific observations were taking place that would change the old paradigm. One of these observations was that of astronomer Vesto Slipher (1875–1969) in 1914. He noted that a number of nebulae (a nebula is a diffuse mass of interstellar gas or dust) were receding from the earth at vary high rates of speed. Astronomers at the time didn't know what to make of this observational discovery, and its significance all but went unnoticed.

Then, in the 1920s, astronomer Edwin Hubble (1889–1953) – using a large 100-inch telescope – noted that the nebulae observed by Slipher were actually galaxies far beyond our own Milky Way galaxy and that they were, in fact, moving farther away at high velocities. Here's how Hubble demonstrated this recession of galaxies. He had been studying the light from distant galaxies, and he noted that the colors (colors understood to be wavelengths of light) emitted by these galaxies did not match the expected wavelengths. Instead, they were shifted to the far end of the red spectrum, and this "redshift" of light from galaxies increased in a direct ratio to how far away the galaxies were located. This observational redshift effect matched the theoretical views which cosmologists had already suggested – that the universe was actually expanding.

Hubble's observational evidence along with the theoretical postulations have caused the vast majority of cosmologists today to agree that the universe originated in an infinitely dense singularity and that, from this initial beginning, space itself has

**Stephen Hawking** (1942–) is Lucasian Professor of Mathematics at the University of Cambridge (a post once held by Sir Isaac Newton). He is widely recognized as the most brilliant theoretical physicist since Einstein. His research has focused primarily on the basic laws governing the universe and, along with Roger Penrose, he showed that Einstein's General Theory of Relativity implied that space and time had a beginning in the big bang and will eventually end in black holes. He has published both academic articles and popular books, including the best selling *A Brief History of Time*.

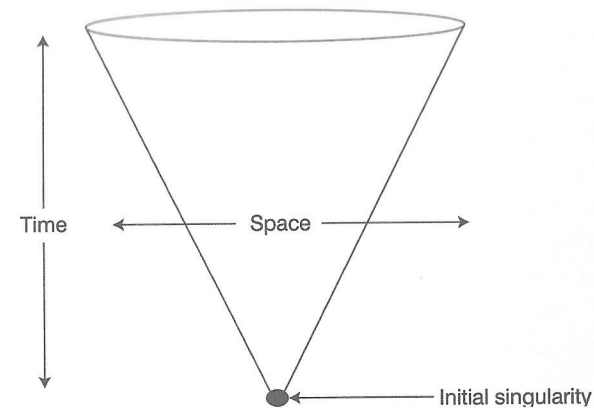


Figure 4.3 The expansion of space with the passage of time

expanded with the passage of time (see Figure 4.3). As theoretical physicist Stephen Hawking (1942–) puts it: "Almost everyone now believes that the universe, and *time itself*, had a beginning at the big bang."<sup>29</sup>

#### OBJECTION: ALTERNATIVES TO THE BIG BANG

Not everyone agrees with the big bang theory, however. There are other models of the universe which have been proposed over the last several decades, including new "brane cosmology" theories that introduce multi-dimensions of the universe.<sup>30</sup> These models are currently considered proto-scientific, and perhaps upcoming decades will offer new insights into their plausibility. At this time, however, the most well-established model of the universe – the one that continues to be most corroborated by the scientific evidence – is the traditional big bang theory. It doesn't explain all that needs to be explained about our universe, though, and, as with all scientific theories, we may be well-advised to keep a tentative hold on it.

#### Is the cause of the universe a personal God?

So far in our examination of the kalam argument, the arguments have focused primarily on whether the universe began to exist, and if so whether its existence needs a cause. The final element of the kalam argument has to do with whether or not the cause of the universe is a personal God.

What might be some reasons for maintaining that the cause of the universe is personal, as kalam proponents maintain? According to big bang cosmology, prior to the beginning of the universe (prior in an ontological, not a temporal, sense) there was no time, space, matter, or energy, and thus no change from one state of affairs to

another. But in such a state, how could a first event occur? Could it arise spontaneously and without a cause? This seems less than reasonable. Another possibility is that it is a *personal* event in which an agent freely chose to act. This is the theistic answer: a timeless, spaceless, matterless, personal God brought the universe into existence by his own free choice. On this view, the decision by God to create the universe was not determined by a previous cause. Rather, it was a self-caused event deliberately chosen by a personal God for a (non-determinative) reason or set of reasons.<sup>31</sup>

But the idea of a self-caused event – and more broadly what is referred to as “agent causation” – has its own set of difficulties, not the least of which is that a self-caused event seems to be an uncaused event. If so, positing a personal God as the first cause solves nothing.

Another possibility is that there is a causal agent outside of our universe which is personal but is not God (at least in the traditional sense). Perhaps a personal but finite being from outside the universe caused the big bang singularity. However, given the constraints of the standard big bang model, such a being would need to be immaterial and timeless, and these are properties atheists find onerous.

## A COSMOLOGICAL ARGUMENT FOR ATHEISM

While the kalam argument utilizes recent work in big bang cosmology as scientific support for the beginning of the universe, it has also been argued that the big bang theory is *incompatible* with theism. The primary defender of this cosmological argument for atheism is Quentin Smith (1952–), and his argument can be presented in the form shown in the “Cosmological argument for atheism” box.<sup>32</sup>

To summarize the argument, the unpredictable and chaotic state of the big bang singularity is incompatible with the creator God of the theistic religions. The argument is logically valid, so again we must consider whether the premises are true. Theists have offered a number of objections to this argument, and we will next consider three of the primary ones.

### Objection 1: the singularity is not ontologically real

According to this objection, premise 1 of the argument is false, for while the big bang *explosion* is taken to be a real event, the *singularity* is understood to be a theoretical fiction, and thus not the earliest state of the universe. If premise 1 is false, the atheistic argument collapses. One proponent of this objection is William Lane Craig:

...the singularity has no positive ontological status: as one traces the cosmic expansion back in time, the singularity represents the point at which the universe ceases to exist. It is not part of the universe, but represents the point at which the

## THE COSMOLOGICAL ARGUMENT FOR ATHEISM

- 1 The big bang singularity (the beginning point of the universe where the curvature of space becomes, theoretically at least, infinite) is the earliest state of the universe.
- 2 The earliest state of the universe is inanimate (2 follows from 1 since the singularity involves the life-hostile conditions of infinite temperature, infinite curvature, and infinite density).
- 3 No law governs the big bang singularity and consequently there is no guarantee that it will emit a configuration of particles that will evolve into an animate universe (based on Stephen Hawking’s *principle of ignorance* in which the singularity is inherently chaotic and unpredictable).
- 4 The earliest state of the universe is not guaranteed to evolve into an animate state of the universe (entailed by premises 1–3).
- 5 Premise 4 is inconsistent with the hypothesis that God – the classical Judeo-Christian-Islamic view of God as creator of the universe – created the earliest state of the universe since it is true that if God created the earliest state of the universe, then God would have ensured that the earliest state of the universe evolved into an animate state of the universe.
- 6 Therefore, the classical Judeo-Christian-Islamic God does not exist (entailed by premises 4–5).

time-reversed contracting universe vanishes into non-being. There was no first instant of the universe juxtaposed to the singularity. The temporal series is like a series of fractions converging toward 0 as its limit:  $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots, 0$ . Just as there is no first fraction, so there is no first state of the universe. The singularity is thus ontologically equivalent to nothing.<sup>33</sup>

Craig argues further that a good reason for interpreting the singularity as unreal is that it is described as having no spatial dimensions and no temporal duration. As he puts it:

“The singularity has zero dimensionality and exists for no length of time; it is in fact a mathematical point.”<sup>34</sup> To hold that such a point is real is to reify a mere mathematical construct.

Smith counters this objection by arguing that there is no reason for rejecting the reality of the singularity; to the contrary, he argues that in standard big bang cosmology the singularity is the *real* terminus of the converging past-directed space-time paths. The debate, then, centers on the metaphysics of time, space, and mathematics.

**Big bang singularity:** a hypothesized point in space–time where the laws of physics break down and the density of the universe and the curvature of space–time becomes infinite. On most big bang models of the universe, this is the point where time itself began.

### Objection 2: God is not bound by laws or a lack of them for accomplishing God's purposes

According to this objection, premise 3 is false for at least two reasons. First, it could be the case that God's plan was to intervene in the early stages of the universe in order to ensure that living organisms, including human beings, would eventually evolve. It is not, necessarily, a sign of poor or irrational planning on God's part to do so. It could be that, unlike the clockmaker universe posited by the deists, God is creatively involved in the universe at different stages of its development. While this may not be the most efficient way to create a universe, argue objectors, the God of the theistic religions is not primarily concerned with efficiency. Such a God is not worried about running out of power.

Second, it could be that, contrary to Smith (and Hawking), the singularity is not a "violent, terrifying caldron of lawlessness."<sup>35</sup> Perhaps there are laws governing the singularity that have yet to be discovered – laws which will demonstrate that the principle of ignorance is false.

Another related response is to deny premise 5 that God would have ensured an animate state of the universe. There doesn't seem to be any logical or metaphysical necessity in God's creating this universe over and above some non-animated one, or for not creating any universe at all, for that matter. However, theists admit that there does seem to be some existential force to, and possibly religious support for, the belief that the God of the major theistic religions would create living organisms (especially rational, moral ones). But perhaps such feelings are wishful anthropocentrism.

### Objection 3: the theistic hypothesis of creation is simpler, and thus more likely to be true, than the atheistic hypothesis

This objection, raised by philosopher Richard Swinburne (1934–) is that a divine creation is simpler than the atheistic view, and as such it is more likely to be true.<sup>36</sup> Swinburne is operating on the scientific principle that the simpler an explanation for a thing, the more likely it is to be true. This principle, along with supposition (1) that the physical universe is a rather complex thing, and supposition (2) that God is a simple being (simple in that a being with infinite power, knowledge, and goodness

is simpler than a being, or object, with finite values), leads to the conclusion that a theistic explanation for the universe is more likely to be true than an atheistic one.

The atheist can respond in a least two ways. First, he could grant the simplicity principle and supposition (2) but deny supposition (1). This is precisely what Smith does. He grants the principle but denies supposition (1) for the following reason: since the singularity has zero spatial volume, zero temporal duration, and does not have particular finite values for its density, "It seems reasonable to suppose...[that] this instantaneous point is the simplest possible physical object."<sup>37</sup> Granting that this simple object is at least as simple as the theistic hypothesis, it is simpler to suppose that the universe began from the same basic kind of stuff (i.e. material stuff) than to posit some additional kind of stuff (i.e. immaterial "God-stuff").

A second response an atheist can offer is to deny the principle of simplicity (probably not a good move, given the way science is actually practiced) or to deny supposition (2).

## SUMMARY

In this chapter, four cosmological arguments were presented: three supporting theism and one supporting atheism. The first argument – the argument from contingency – concluded that God, a necessary being, must exist in order to cause the contingent things in the universe to exist. Five major objections were raised against it. The second argument – the argument from sufficient reason – concluded that there must be an explanation outside of the universe, one that is sufficient unto itself (a necessary being), since everything which exists in the world needs an explanation for its existence, and nothing in the world provides an explanation for itself. Four objections were raised against it, each one focusing on some enigmatic aspect of the notion of a sufficient reason or explanation. The third argument – the kalam argument – concluded that there must be a personal cause for the universe. It utilized one philosophical argument and two scientific evidences to support the premise that the universe began to exist, and also included a philosophical argument that this beginning must be personal. Four objections were raised, two for the first philosophical argument and one for each of the alleged scientific evidences. Objections against a personal beginning were also noted. The fourth argument – the cosmological argument for atheism – concluded that God must not exist, for God's existence is incompatible with the unpredictable and chaotic state of the big bang singularity. Three objections were raised against this argument.

Various versions of the cosmological argument have been debated for centuries, and with recent advances in astronomy, cosmology, and astrophysics, there continues to emerge new material for rich and fruitful dialogue.

## QUESTIONS FOR REVIEW/DISCUSSION

1. Is it reasonable to be a theist without evidence? Is it reasonable to be an atheist without evidence? What kind of evidence should count in such discussion (e.g. philosophical, scientific, experiential, etc.)?
2. Five objections were offered to the argument from contingency. What are your thoughts on these objections and the responses and counter-responses to them? Can you think of other objections?
3. How does the argument from contingency differ from the argument from sufficient reason? Do you find either of them persuasive? Why or why not?
4. What do you make of the parable of the translucent sphere? Who do you believe is being more reasonable in this case – the theist or the atheist? Why?
5. What does the universe having a beginning have to do with the existence of God?
6. How would you explain, in your own words, the two scientific evidences for the beginning of the universe? What about the objections to them?
7. The crossing the infinite argument for the beginning of the universe is somewhat abstract. Do you understand it? If so, how would you explain it to someone who is not familiar with it? Is it plausible?
8. Explain the argument that the beginning of the universe is personal. Is it more or less plausible than an impersonal explanation?
9. The cosmological argument for atheism is logically valid. What do you make of the objections raised in order to disprove one or more of its premises?
10. Are you persuaded by either of the three cosmological arguments for God's existence described in this chapter? Are they more persuasive taken together?

## FURTHER READING

- Aquinas, Thomas (1948) *Summa Theologica*. Trans. Fathers of the English Dominican Province. Notre Dame, IN: Ave Maria Press. (Contains the classic presentation of several versions of the cosmological argument.)
- Craig, William Lane (1980) *The Cosmological Argument from Plato to Leibniz*. London: Macmillan. (An excellent overview of the history of the cosmological argument; it's especially helpful in delineating the arguments of the medieval Arabic and Jewish thinkers.)
- Craig, William Lane and Quentin Smith (1993) *Theism, Atheism, and Big Bang Cosmology*. New York: Oxford University Press. (Craig, a Christian theist, and Smith, an atheist, go head to head – chapter by chapter – defending their views; technical, but an outstanding work.)
- Everitt, Nicholas (2004) *The Nonexistence of God*. New York: Routledge. (Chapter 4 focuses on cosmological arguments; highly readable.)
- Geisler, Norman and Winfried Corduan (1988) *Philosophy of Religion*. 2nd ed. Grand Rapids, MI: Baker Books. (Chapter 8 contains a helpful list of many different kinds of cosmological arguments and objections.)

- Kant, Immanuel (1929) *Critique of Pure Reason*. Trans. and ed. N. Kemp Smith. London: Macmillan. (This classic work contains influential criticisms of the cosmological argument and other arguments as well.)
- Leibniz, G. W. (1898) "Monadology," in *The Monadology and other Philosophical Writings*. Trans. R. Latta. Oxford: Oxford University Press. (This work contains Leibniz's cosmological argument from sufficient reason.)
- Le Poidevin, Robin (1996) *Arguing for Atheism: An Introduction to the Philosophy of Religion*. New York: Routledge. (An erudite but readable presentation by a leading philosopher; note especially Chapters 1 and 3.)
- Mackie, J. L. (1982) *The Miracle of Theism: Arguments for and against the Existence of God*. Oxford: Clarendon Press. (Mackie was a well-known and well-respected atheist philosopher; Chapter 5 argues against cosmological arguments.)
- Plato ([c.360–347 BCE] 1980) *Laws*. Trans. Thomas L. Pangle. Chicago, IL: University of Chicago Press. (This work offers one of the earliest forms of the cosmological argument.)
- Rowe, William (1998) *The Cosmological Argument*. New York: Fordham University Press. (A careful examination of different versions of the cosmological argument.)
- Silk, Joseph (2001) *The Big Bang*. 3rd ed. New York: Henry Holt and Company. (Silk is the Head of Astrophysics at Oxford University, and in this work he draws upon the latest theories and empirical evidences in describing big bang cosmology from the first microseconds of the universe through its evolution to the present and on into the future.)

## WEBSITES

- <http://www.science.uva.nl/~seop/entries/cosmological-argument/>  
A helpful and concise entry from the *Stanford Encyclopedia of Philosophy* on the cosmological argument by philosopher Bruce Reichenbach.
- <http://groups.yahoo.com/group/reformed-epistemology>  
A discussion group focused on questions in religious epistemology – most especially the work of twentieth-century philosophers who maintain that religious belief can be rational and justified.
- <http://www.infidels.org>  
A website operated by the Internet Infidels, an organization dedicated to defending and promoting a naturalistic worldview; contains a number of articles on the cosmological argument.
- <http://www.ditext.com/russell/debate.html>  
An online transcript of the Copleston/Russell debate on the argument from contingency.
- <http://www.leaderu.com>  
Leadership University is a web-based organization that contains a number of articles in support of the theistic worldview, including articles on the cosmological argument by William Lane Craig and other scholars.
- <http://map.gsfc.nasa.gov/universe/>  
A NASA-based web page on cosmology; it also contains links to big bang theory and related topics, including significant images.